Ethics, Codes, and Behavior

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Over the years, several professions have developed codes of ethical conduct, notably psychology, law, and medicine. Recently physical education, health, and other education-related professions have strongly considered developing codes. It seems that two prerequisites must exist to determine whether a code of ethics is needed: the existence of a problem, and the presence of a standard of behavior that can be used as an example.

The first question to be answered is, Does a problem in ethical conduct exist? Historically, this question can be answered yes, as can the second question: Does a standard of behavior exist? Because these affirmative answers indicate the basis for a code of ethics, the next issue to be faced is, Will a code of ethical conduct have any impact on behavior? An answer to this question warrants a brief examination of the historical development of such codes and the current situation in academics and science.

Following World War II, the discovery of abuse by Nazi scientists led to development of the first ethical code of conduct that applied to scientists, the Nuremberg Code. More recent examples of such codes are the Draft Code of Ethics of the World Medical Association (Geneva, 1961) and the Helsinki Declaration of 1964 (revised in 1975). In the United States, Congress has passed regulations specifying criteria for scientific research and requiring researchers to report any incidence of misconduct (42 Code of Federal Regulations, Part 50; 45 Code of Federal Regulations, Part 46).

Despite the presence of these codes, newspapers and professional journals continue to report dishonesty and circumvention of the scientific method in the research community. Stories of researchers manufacturing data at Harvard University and the overreporting of expenses to increase grant income at Stanford University were announced in recent newspaper headlines. As early as 1980, Brackbill and Hellegers reported a concern over changes in the ethics of scientists:

Most scientists are under great pressure to conduct research and publish it. Publication is the sole route to professional success, to salary increases, to tenure, to promotion. Scientists, therefore, regard the terms and conditions of publication as matters of considerable importance. There is no question

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that ethical review as a gate to publication is an effective means of maintaining ethical standards in research. It is also the most feasible method. (p. 20)

More recently, Wrather (1987) observed that the question of fraud in science is crucial and has more questions than answers. She indicated that the incidence of fraud in science appears to have increased in recent years to the extent that misrepresentation threatens the conduct of scientific research. Questions such as how much scientific misconduct is occurring and what constitutes fraud must be answered. Confidentiality for whistle blowers and the development of guidelines for use by universities and funding agencies are important first steps in reducing fraud and misconduct.

The pressure for academic success and obtaining a livelihood with some job security produces dishonesty in science and research, according to such reports. Fraud and misconduct must be addressed so as to reduce or eliminate their occurrence from scientific pursuits. If society is to benefit from scientific research, public and professional confidence in the veracity of the study and information being disseminated is crucial.

**Scientific Misconduct**

If codes and other forms of regulation are to eliminate misconduct in science, then we must know the problem areas that require solution. To determine what dishonesty exists in research, Shore (1991) analyzed cases obtained from National Institutes of Health (NIH) files using the Freedom of Information Act and from Harvard University Medical School. In cases involving dishonesty in laboratory research, two-thirds involved fabrication and falsification, plagiarism, and nonpublication of data that would refute prior results. These are situations where guidelines and ethical standards would least likely prevent dishonesty. The remaining cases involved behaviors that are likely to be influenced by guidelines, including the need for improved data gathering, storage, and retention procedures; authorship problems; and publication practices. Cases of dishonesty in clinical studies identified problem areas involving the disregard of protocol, such as inconsistent logging of information, poor choice of controls, breaking of blinding codes or not using blinds, and inaccurate logging of patient data from patient files or study notebooks.

Using data from NIH investigators, Russell (1991) reported similar transgressions in research funded by NIH. The problem areas observed by NIH were identified as failure to retain primary data; overinterpretation or misrepresentation of results; selective inclusion or exclusion of information; alteration of findings resulting in either no change or a favorable change in outcome; plagiarism, either through not recognizing others' work or by citing it as one's own; and manufacturing data without supporting evidence. As was the case with the misconduct reported by Shore, some of these transgressions were the result of the researcher's character and cannot be prevented by the adoption of codes of ethical conduct (see Table 1).

These reports showed that the checks and balances of the scientific method of inquiry can be circumvented by fraudulent and dishonest acts of researchers. Some problems in science are the result of deliberate misconduct, whereas others result from mistakes and poor organization or techniques. When dishonesty results
Table 1

<table>
<thead>
<tr>
<th>Type of problem</th>
<th>Cases reported</th>
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<tbody>
<tr>
<td>Laboratory research</td>
<td></td>
</tr>
<tr>
<td>Fabrication and falsification</td>
<td>16</td>
</tr>
<tr>
<td>Plagiarism</td>
<td>7</td>
</tr>
<tr>
<td>Nonpublication of data</td>
<td>2</td>
</tr>
<tr>
<td>Data gathering, storage, and retention</td>
<td>9</td>
</tr>
<tr>
<td>Authorship</td>
<td>2</td>
</tr>
<tr>
<td>Publication practices</td>
<td>2</td>
</tr>
<tr>
<td>Clinical research</td>
<td></td>
</tr>
<tr>
<td>Disregard of protocol and logging data</td>
<td>6</td>
</tr>
<tr>
<td>Use of adequate controls</td>
<td>2</td>
</tr>
<tr>
<td>Use of blinds</td>
<td>2</td>
</tr>
<tr>
<td>Total cases studied</td>
<td>48</td>
</tr>
</tbody>
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from fabrication and falsification of data or plagiarism and selective publication of results, the character of the researcher produces the lack of integrity. In either case, the findings reported by Shore and Russell emphasize the need for ethical researchers if scientific integrity is to be achieved and maintained.

Philosophy of Ethics

Philosophers and scientists have turned to the study of ethics in attempting to resolve issues of misconduct in science. Kretchmar (1992) has summarized for us the nature of ethics, procedures for making ethical decisions, and justifications of ethical decisions. I would like to highlight two philosophical approaches that appear to be available for use in ethical decision making.

The use of a philosophy of ethics in decision making is not a simple issue. Kimmel (1988) discussed ethical theories and standards used as guidelines for research. Because scientists and others can differ in their approaches to ethical decision making, it is important for them to be aware of what approach they use when faced with a moral dilemma. The issue is further complicated by a disagreement among philosophers as to the precise scope of ethics. Some accept the notion of normative ethics, or a set of principles that guide human behavior. Others argue for a metaethical approach that focuses on the analysis or logic of moral concepts rather than the development of a systematic theory of ethics for daily living. Normative ethics sets forth standards used to judge the morality of actions, whereas metaethics considers what people are doing when they make moral decisions.

In spite of this philosophical debate, the government and professional organizations have rushed to embrace a normative approach. Consequently, a
series of rules, regulations, and procedures have been put into place to guide research, especially scientific investigations involving human or animal subjects. The intent is to provide rules that are applicable to all research and professional decision making.

Using this system of ethics, judgments, if challenged, may be defended ethically by showing they conform to one or more rules or norms (a rule being a more general statement that actions of a certain type ought or ought not to be done because they are right or wrong). At an even more general and fundamental level, ethical principles exist that serve as foundations for the rules and norms. Finally, there are ethical theories that consist of systematically related bodies of principles and rules. At the heart of this system lies the concept that basic ethical principles exist—general judgments that serve as the basic justification for the many particular prescriptions for and evaluations of human actions (National Commission, 1976, 1977).

Proponents of this ethical system believe that a fundamental ethical principle can be formulated. This principle exists within a system of ethics and is taken as an ultimate foundation for any second-order principles, rules, and norms. The fundamental principle represents a "pure" or "basic" ethical value, as it is not derived from any other statement of ethical values. Thus, an ethical norm is a statement manifesting that actions of a certain type ought (or ought not) to be done. Ethical norm statements contain the words should, ought, must, or forbidden. Examples of ethical norm statements present in current codes of ethics include the following.

The experiment should be so designed and based on the results of animal experimentation and a knowledge of the natural history of the disease or other problem under study that the anticipated results will justify the performance of the experiment. (Nuremberg 3)

The experiment should be conducted only by scientifically qualified persons. The highest degree of skill and care should be required through all stages of the experiment of those who conduct or engage in the experiment. (Nuremberg 8)

Biomedical research involving human subjects must conform to generally accepted scientific principles and should be based on adequately performed laboratory and animal experimentation and on a thorough knowledge of the scientific literature. (Helsinki I. 1)

Biomedical research involving human subjects should be conducted only by scientifically qualified persons and under the supervision of a clinically competent medical person. The responsibility for the human subject must always rest with a medically qualified person. (Helsinki I. 3)

Approval of such research shall be based upon affirmative determinations by the IRB (Institutional Review Board) that the research methods are appropriate to the objectives of the research and the field of study. (National Commission, 1978, p. 18)

To show respect for such autonomous persons requires that we leave them alone, even to the point of allowing them to choose activities that might be harmful (e.g., mountain climbing), unless they agree (consent) that we may do otherwise. We are not to touch them or to encroach upon their private spaces unless such touching or encroachment is in accord with their wishes. (Levine, 1981, pp. 70-71)
Respect for persons incorporates at least two basic ethical convictions: First, that individuals should be treated as autonomous agents, and second, that persons with diminished autonomy and thus in need of protection are entitled to such protection. An autonomous person is . . . an individual capable of deliberation about personal goals and of acting under the direction of such deliberation. (National Commission, 1976)

The question remains, however, can one basic or fundamental ethical principle serve in all situations? If so, what is it? The current need for research and policy on Acquired Immunodeficiency Syndrome (AIDS) illustrates the issues raised when dealing with ethics in research and science. The ethical norm statements cited indicate that research must be based on an adequate background of animal research and adequately performed laboratory research before the participation of human subjects. However, the desperate need for medical treatments arising from the pressure to do something caused governmental agencies to issue guidelines allowing drug companies and physicians to bypass the traditional procedures for testing medicines for safety and efficacy.

Some individuals argue that safety is not a large issue when people are afflicted with a fatal disease and that they should be provided with any and all opportunities, however risky, to receive the treatments they wish to endure. However, even in such dire circumstances, highly toxic drugs can potentially reduce the life span or quality of life that would exist without exposure to a questionable treatment. A second, equally important ethical question arises: Absent the use of traditional methods of scientific evaluation, how will the quality and effectiveness of these clinical trials be determined? Should the traditional ethical norm statements be discarded in the face of pressures to do something, anything, to stop the advance of a fatal communicable disease? Biomedical research is used to influence and guide policy development, so the quality of research is of paramount importance to decision makers. Our responses to the AIDS epidemic have been and continue to be reactive, which compromises the government’s ability to develop effective policy. Thus, the abandonment of traditional scientific methods has a great impact on society as a whole, and increased risk from poor research is not limited to those individuals presently having AIDS and electing to receive questionable treatments (Kaimingk & Secchrest, 1990).

Answers to these and similar questions related to research depend upon one’s philosophical approach to ethics. Is there a fundamental ethical principle that can guide all decisions? Can a series of ethical rules apply to all situations faced in science and research? Does the ethical rule used in decision making vary from situation to situation? Should instruction in ethical decision making, rather than normative ethics, be advocated by the profession?

**Toward Prevention of Fraud and Misconduct**

As Fraleigh (1992) pointed out, the self-regulatory function of codes has not been particularly effective. When fraud, dishonesty, and other forms of scientific misconduct are present, the approach usually adopted has focused on the development of codes of ethical conduct coupled with the detection and punishment of wrongdoers. This approach requires the use of due process and
a procedure to provide the accused with opportunities to rebut the charges. When professionals have been found in violation of professional standards, a variety of sanctions have been imposed. These sanctions can be grouped in two categories: those imposed internally by the employing university or institution and those imposed by an external source, such as governmental funding agencies or professional organizations (Russell, 1991). The types of sanctions that have been frequently imposed are summarized as follows from Russell.

**Internally Imposed Sanctions**

- Verbal reprimand
- Letters of reprimand, either not a part of the permanent record or included in the permanent record
- Monitoring of research with prior review of all publications
- Supervision of grant submissions
- Salary freeze
- Promotion freeze
- Restriction of academic duties
- Termination of work on the project
- Reduction in professorial rank
- Separation from university without loss of benefits
- Separation from university with loss of benefits
- Fines to cover costs

**Externally Imposed Sanctions**

- Revocation of prior publications
- Letters to offended parties
- Discontinuance of service to outside agencies
- Prohibition of obtaining outside grants
- Release information to agencies, profession, newspapers, and so on
- Referral to legal system for further actions
- Fines to cover overhead costs

The imposition of sanctions may or may not be coupled with a rehabilitation program. However, not all persons who violate ethical principles or act without integrity are amenable to rehabilitation. Repeat offenses are likely because of the great emphasis society places on success. If repeat offenses are to be eliminated, the present motivational system with its attendant pressures must be changed. At the very least, proper mentoring is required, including the presence of adequate contextual patterns and mechanisms.

According to The Final Rule, published in the *Federal Register*, August 8, 1989 ("Responsibilities," 1989), intent is not required for a finding of scientific misconduct. Therefore, both mistake and misconduct can be treated as misconduct. Researchers active in funded research, however, recommend a bifurcated approach that differentiates between misconduct and unintentional mistakes. This approach would discipline differently individuals found to have engaged in misconduct and those found guilty of scientific mistakes, with misconduct receiving
sanctions and mistakes receiving remedial activities such as oversight and monitoring.

If not all individuals who engage in scientific misconduct will benefit from or be amenable to rehabilitation, some method must be developed to address this reality. Unfortunately, at present there is no way to predict who will or will not be able to be rehabilitated. Individual character will determine whether a person will engage in misconduct; because character is a rather stable part of personal make-up, professional admonitions and policies will not produce a change. As a consequence, any change in conduct on the part of some individuals will require a change in the motivational system used and the attendant pressures. Proper mentoring, coupled with adequate content patterns and mechanics, is one technique that can produce a change in behavior. Better results with attempts to produce behavioral change come with modification of the context in which individuals work (i.e., close supervision by senior colleagues). Still, the principal deterrent to fraud in science and research is the high probability that fraudulent data will be detected upon its release and publication, not a code of ethical conduct describing appropriate behavior.

In response to the need for improved scientific integrity, several professional organizations and academic institutions have developed policies and procedures directed to reducing academic and scientific dishonesty. However, as suggested earlier, the prevention of fraud and misconduct must be the responsibility of each member of the scientific and academic community. If academic and research are to have integrity, each person must take responsibility for the honesty and accuracy of his or her projects. Faculty must adhere to and teach high ethical standards as well as research techniques and academic competencies.

Rules and guidelines can be developed to cover procedural issues such as the storage of data, the presentation of a proposed study to an institutional review board for approval, the announcement and publication of research findings, and authorship of manuscripts. However, elimination of such outright dishonesty as manufacturing data, plagiarizing, and breaking blinding codes cannot be prevented by rules and regulations, because these problems reflect the character of the researcher involved. Preventing such fraudulence requires either changing the character of the researcher or preventing an unethical individual from conducting research. Studies have not indicated that either practice is currently possible.

Because it is difficult, if not impossible, to develop a code of conduct that applies to all possible situations encountered during research, an informative, educational approach during the training of scientists, rather than sole reliance on a regulatory code of rules, may be another critical part of the answer. This does not mean that codes of ethics are without merit; rather, codes alone will not resolve the problems, and a more comprehensive approach is required. In such a scenario, the process by which ethical decisions are made (metaethics), as well as expectations of professional and governmental agencies (normative ethics), must be taught to future scientists. The purpose of this educational approach is to teach students how to make ethical decisions and on what basis. With such knowledge, the researcher’s ethical decisions will be based on the values and experiences of others engaged in similar research or on an appeal to some authority.

There is not agreement as to what constitutes an authority to use for research decision making. Some individuals recognize religious principles, whereas others
look for authority outside religion. Common appeals outside religion might include the following:

- The individual is precious, and the individual’s benefit takes precedence over that of society.
- Equality is of the utmost importance, and everyone must be treated equally.
- Fairness is the overriding guide to ethics, and all decisions must be based on fairness.
- The welfare of society takes precedence over that of the individual, and all must be done for the benefit of society.
- Truth, defined as being true, genuine, and conforming to reality, is the basis for all decision making.

Each of these appeals to authority requires understanding the consequences of its use by researchers. For example, what happens when all is accomplished for the benefit of single individuals rather than the collective good of society? We recognize that all individuals possess equal rights in our system of government, but not all individuals have equal abilities or needs, so equal treatment may produce disparate results. The concept of fairness is fraught with difficulties; what is fair for one individual may not be fair for another. What happens to individuals when society takes precedence? Is it important that individuals have rights? What is truth—a series of facts or a fundamental knowledge or belief? Ethical decision making requires a careful balancing of many issues, needs, and rights.

Many scientists, according to Reece and Siegal (1986), support the ideal of attaining knowledge for its own sake. Individuals following this approach believe that knowledge is intrinsically valuable, that is, valuable in itself and not because it can produce other ends. Thus our culture upholds education, knowledge, and understanding. We extol the virtues of education and pride ourselves on being civilized. This emphasis on the pursuit of knowledge leads to moral issues and systems of ethics, particularly in terms of the authority used for decision making.

One group of scholars, the ideal utilitarians, holds that truth is the authority that should be used to guide ethical decision making in science. Truth is seen as an independent human good that ought morally to be sought for itself, not just for the satisfaction that occurs during the pursuit. Following this approach, the authority is that ‘‘truth and beauty are ideal values and that morality consists in promoting these values as well as pleasures’’ (Reece & Siegal, 1986, p. 61). Truth, according to Webster’s Dictionary, is ‘‘the body of real things, events and facts; a judgment, proposition or idea that is true or accepted as true; agreement with fact or among true facts or propositions.’’ However, the question asked earlier remains. Is truth the facts, the data, or is truth the meanings and understandings, concepts and ideas that flow from data and their analyses? If truth is the understandings or concepts, how do we know truth when reasonable people differ in the ideas developed through interpreting data? If truth is the facts or data, how can truth exist without meaning?

An unethical investigator can still circumvent this approach to maintaining scientific integrity. Thus, if any improvement in professional ethical conduct and integrity is to occur, a shift in emphasis and efforts to preventing problems must be coupled with a strong deterrent factor of early detection and punishment of
violators. The data retention rule required by federal agencies and adopted by most academic communities is the most critical ingredient in preventing misconduct. This requirement must be coupled with adherence to the scientific method when developing and conducting research. An important part of the scientific process is dissemination of knowledge. The part of this process used to promote integrity and honesty occurs through publication of manuscripts in professional journals requiring peer review.

**Conclusions**

So, having visited the philosophy of ethics and codes of ethics, where are we? Certainly some problems in professional conduct can be resolved by ethics statements or codes, but other problems will remain. Codes of conduct cannot deal with all possible situations requiring ethical decisions. Situational ethics do little to resolve the problem, as constancy and stability in decision making are lacking. Ethical behavior in science and academe remains a joint responsibility of institutions, professional organizations, and individuals. Just as codes of ethics provide guidelines and examples of acceptable conduct, mentoring new professionals and peer review of manuscripts provides input on acceptable professional behavior. Finally, the individual professional cannot be ignored; the ultimate responsibility for ethical conduct rests with the individual who makes the decisions about appropriate behaviors. Consequently, I will close with a series of suggestions for responsibilities appropriate for academicians and researchers.

**Individual Responsibilities**

Maintaining integrity and honesty in research and science requires more than adopting governmental and institutional policies, regulations, and guidelines. It requires appropriate behaviors on the part of each professional. The following are commitments that each scientist can adopt to become more sensitive to ethical decision making and behavior in research.

To improve ethical practice and integrity in science, I will:

- follow the scientific method, using the built-in checks and balances that eliminate bias in research;
- prepare myself academically and technically to the extent necessary to conduct the research in my field;
- look for ethical issues when conducting research and use appropriate decision-making practices to resolve them;
- be knowledgeable of and implement governmental practice and guidelines in research where appropriate;
- be aware of the need for honesty and integrity in science and research, supporting its practice by myself and my peers;
- not plagiarize or engage in other dishonest behavior, such as trimming, cooking, faking, or stealing data and ideas;
- support and defend the general conclusions of any study that I author or coauthor;
- keep research data immediately available to scientific collaborators and supervisors for review; and
- be knowledgeable of and conform to standards of professional behavior expressed through codes of ethics.
References


